



Mekong River Commission

**Weekly Wet Season Situation Report
in the Lower Mekong River Basin
15 – 21 October 2024**

Prepared by
The Regional Flood and Drought Management Centre
22 October 2024

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Mekong River Commission

Documentation and Learning Centre

184 Fa Ngoum Road, Unit 18, Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR

Telephone: +856-21 263 263 | E-mail: mrcs@mrcmekong.org | www.mrcmekong.org

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Key Messages

Key messages for this weekly report are presented below.

Rainfall monitoring and forecast

- In the period of 15 – 21 October 2024, light to moderate rainfall has been observed over the LMB. Especially, heavy rain occurred in some areas in Chiang Saen, Svay Chrea, Stung Chinit, Oudor Meanchey, Svay Chrea, Bassac Chaktomuk, Snoul, Sesan, Mdrak.
- From 22 – 28 October 2024, Light to moderate rain is expected over the Lower Mekong Basin. However, heavy rain may occur in some areas in the central and lower part of Lao PDR from 27 - 28 October.

Water level monitoring and forecast

- At 22 key monitoring stations along the Mekong mainstream from 15 – 21 October 2024, water levels at all stations along the Mekong mainstream have decreased. However, water levels are in normal conditions. The total accumulated volume of the reverse flow to Tonle Sap Lake remains 25.49 Km³. This value has remained constant since 01 October 2024
- In the period of 22 – 26 October 2024, water levels at almost all stations along Mekong mainstream from are likely expected to drop except for Chiang Saen station.

Drought condition and forecast

- From 15 – 21 October 2024, the LMB is experiencing normal to wet conditions, except for some areas in the northeastern of Thailand. The observed drought was caused primarily by meteorological indicator.
- From 22 – 28 October, the LMB is likely at normal conditions. No drought is forecasted for the whole region, except for some arears in Khammouan and Savanakheth (Lao PDR).

1 Introduction

This Weekly Wet Season Situation Report presents a preliminary analysis of the weekly hydrological situation in the Lower Mekong River Basin (LMB) for **15 – 21 October 2024**. The trend and outlook for water levels are also presented.

This analysis is based on the daily hydro-meteorological data provided by the Mekong River Commission (MRC) Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – and on satellite data. The water level indicated in this report refers to an above zero gauge of each station.

The report covers the following topics that are updated weekly:

- General weather patterns, including rainfall patterns over the LMB.
- Water levels in the LMB, including in the Tonle Sap Lake.
- Flash flood and drought situation in the LMB.
- Weather, water level and flash flood forecast, and
- Possible implications.

Mekong River water levels are updated daily and can be accessed from:

<http://ffw.mrcmekong.org/bulletin.php>.

Drought monitoring and forecasting information is available at:

<http://droughtforecast.mrcmekong.org>

Flash flood information is accessible at: <http://ffw.mrcmekong.org/ffg.php>

2 General Weather Patterns

During last week, the high-pressure system covering upper the Lower Mekong will weaken. Light to moderate rain is expected over the Lower Mekong Basin. However, isolated heavy rain may occur in some areas in the lower part of the LMB include Cambodia and the Mekong Delta during this period.

Next week from 22 – 28 October 2024, at 03:00 PM 22 October, tropical storm Trami was located at approximately 14.1°N latitude and 126.7°E longitude over the Philippine Sea. The storm's maximum wind speeds near its center range between 75 and 90 km/h, and it is moving west-northwest at a speed of 15 km/h. Heavy rainfall is anticipated in some areas of central and southern Laos from 27 to 29 October 2024 due to the storm's influence.

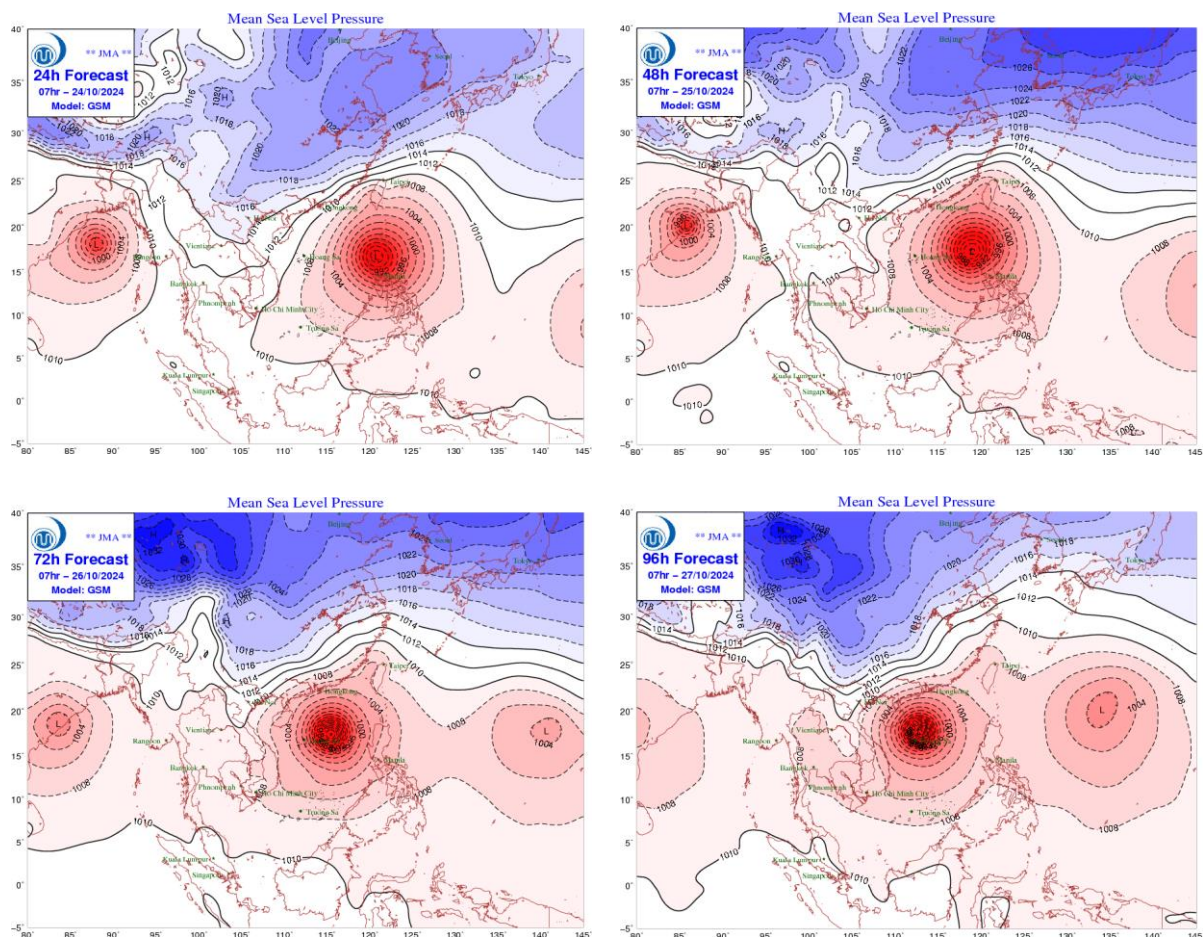


Figure 1: Weather conditions over the LMB from 22 - 28 October

According to the ASEAN Specialised Meteorological Centre (ASMC, <http://asmc.asean.org/home/>), the subseasonal weather outlook (14 – 27 October 2024) indicates that drier conditions is expected for the entire the LMB, while warmer conditions are predicted central to upper parts. **Figure 2** shows the outlook of weather condition from 14 – 27 October 2024 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

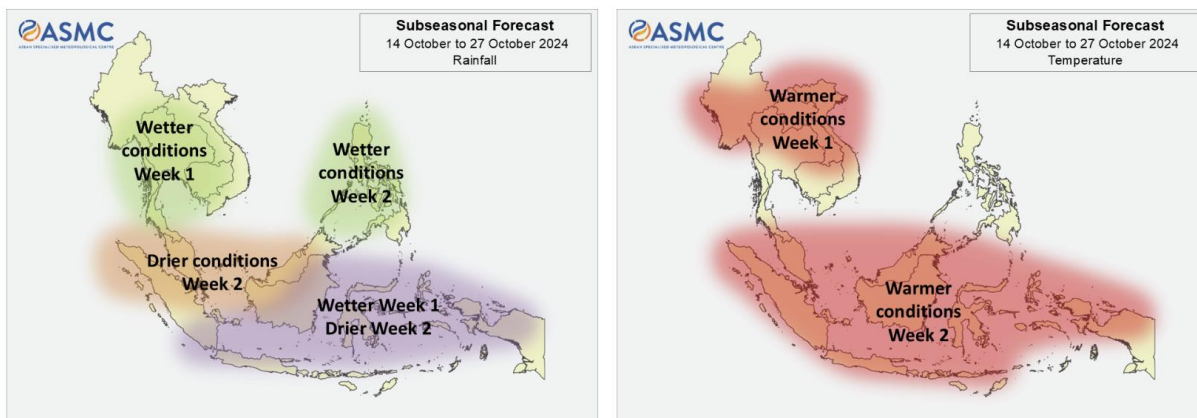


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

Based on the tropical storm risk (TS) (https://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/RSMC_HP.htm), there is one active tropical storm at NW pacific system as of 22 October 2024 as displayed in Figure 3.

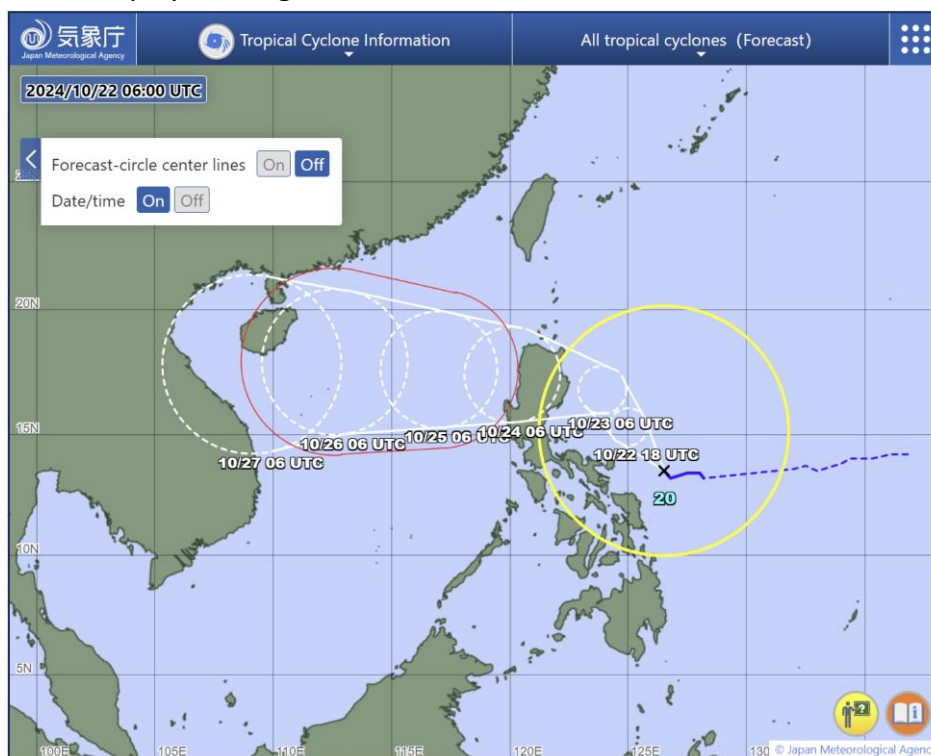


Figure 3: One tropical storm risk observed on 22 October 2024

3. Rainfall and Water Level Monitoring

3.1. Rainfall monitoring

The weekly accumulated rainfall is based on the observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – from 15 – 21 October 2024 (Figure 4), light to moderate rainfall has been observed over the LMB. Especially, heavy rain occurred

in some areas in Chiang Saen, Svay Chrea, Stung Chinit, Oudor Meanchey, Svay Chrea, Bassac Chaktomuk, Snoul, Sesan, Mdrak.

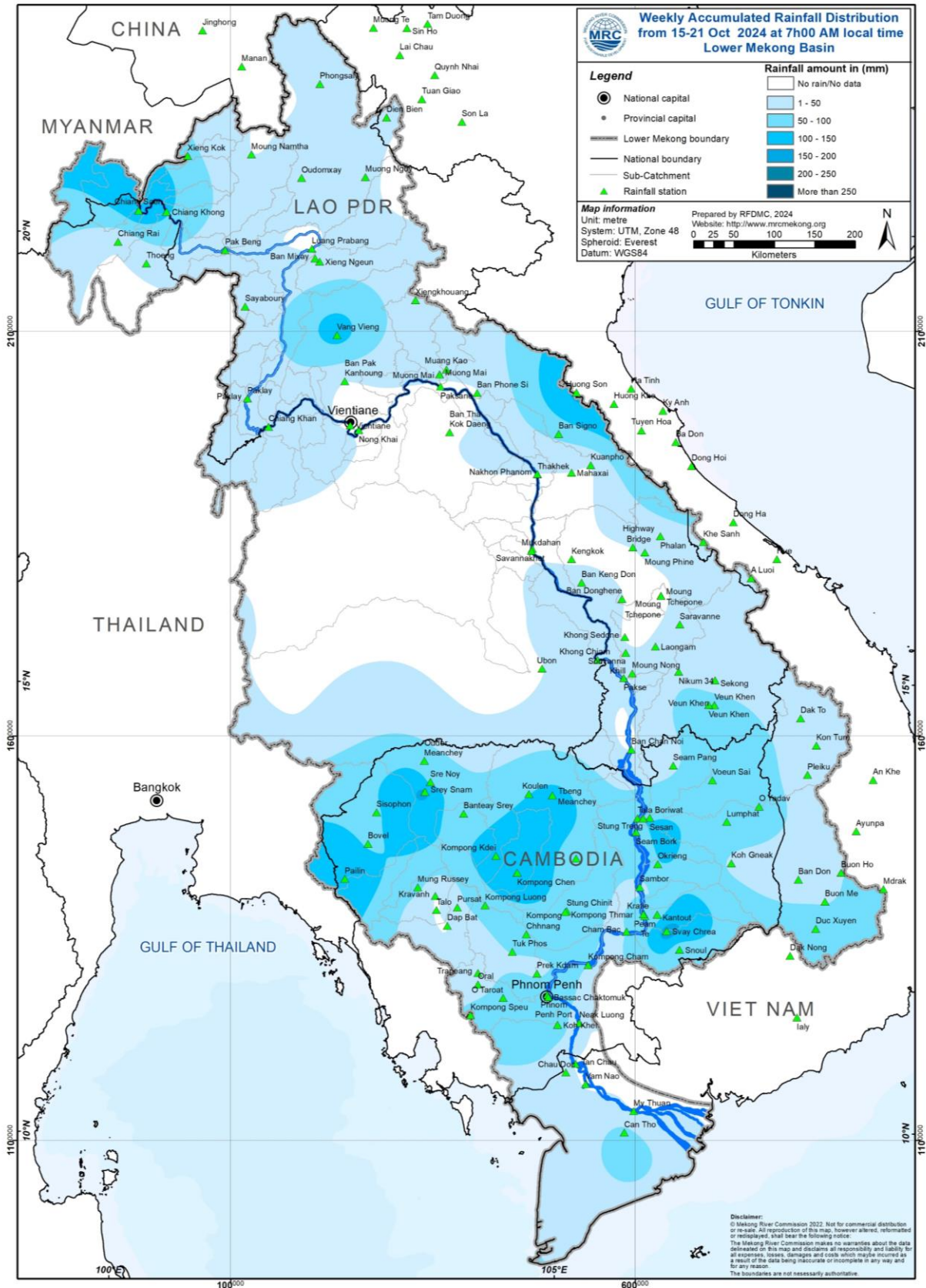


Figure 4: Weekly rainfall distribution over the LMB during 15 – 21 October 2024

3.2. Water level monitoring

The hydrological regimes of the Mekong mainstream are illustrated by recorded water levels and flows at key mainstream stations: at Chiang Saen to capture mainstream flows entering from the Upper Mekong Basin (UMB); at Vientiane to present flows generated by climate conditions in the upper part of the LMB; at Pakse to investigate flows influenced by inflows from the larger Mekong tributaries; at Kratie in Cambodia to capture overall flows of the Mekong Basin; and at Viet Nam's Tan Chau and Chau Doc to monitor flows to the Delta.

The key stations along the LMB and their respective model application for River Flood Forecasting during the wet season from June to October and River Monitoring during the dry season from November to May are presented in **Figure 5**. The hydrograph for each key station is available from the MRC's River Flood Forecasting: <http://ffw.mrcmekong.org/overview.php>.

During 15 – 21 October 2024, the observed water level (WL) at Jinghong hydrological station¹, was almost constant and ranges between 535.23 m and 536.08 m, which are corresponding to the outflow between 829.00 m³/s to 1,430.00 m³/s (recorded on 7:00 am), respectively (**Figure 6**). The water level in Chiang Saen Station decreased from 3.46 m to 3.07 m. At the same period, the water level in Luang Prabang station also decreased with an approximate value of -0.64 m from 10.98 m to 10.34 m as compared to the previous week. Water levels at Chiang Khan, Vientiane and Nongkhai have also decreased from 8.55 m to 7.97 m, 5.56 m to 4.76 m, and 5.96 m to 4.96 m, respectively. Moving downward at Paksane, Nakhon Phanom, Thakhek, Mukdahan, Savannakhet, Khong Chiam and Pakse stations, water levels have also been decreasing from 7.24 m to 6.24 m, 6.73 m to 5.40 m, 7.75 m to 6.53 m, 6.43 m to 5.20 m, 4.86 m to 3.64 m, 7.91 m to 6.50 m, and 6.22 m to 4.92 m, respectively.

At Stung Treng, Kratie, and Kampong Cham, Phnom Penh Bassac, Phnom Penh Port, Koh Khel Neak Luong and Preak Kdam stations water levels have also decreased from 6.30 m to 5.82 m, 15.33 m to 14.33 m, 10.12 m to 9.18 m, 7.88 m to 7.23 m, 6.62 m to 6.04 m, 6.86 m to 6.42 m, 5.74 m to 5.28 m, and 7.18 m to 6.81 m, respectively.

From to the previous week, the water levels from 15 to 21 October 2024 at Viet Nam's Tan Chau and Chau Doc, water levels have fluctuated from 3.05 m to 2.72 m and from 2.92 m to 2.62 m, respectively.

¹ Near-real time data of hydro-meteorological monitoring at the Jinghong hydrological station is available at <https://monitoring.mrcmekong.org/>

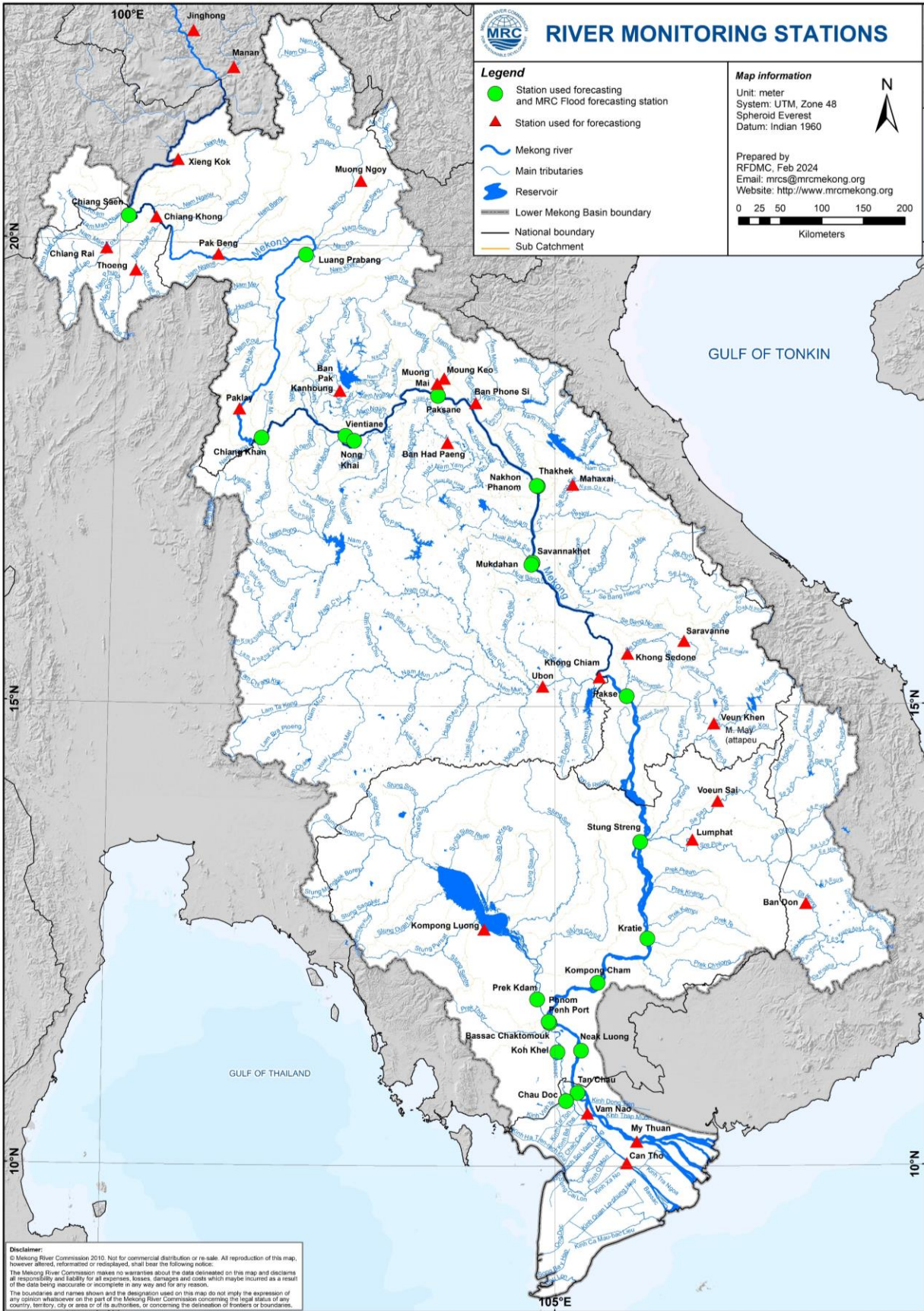


Figure 5: The key stations along LMB for river flood forecasting

The water levels in key monitoring stations on 21 October, water levels at all stations along Mekong mainstream are in normal conditions with decreasing trends. Moreover, all stations with available PMFM (Article 6C) thresholds are in normal conditions. The graphics of water level monitoring in all key stations are presented in **Annex A** and the weekly water levels and rainfall at each key station are summarised in **Annex B**.

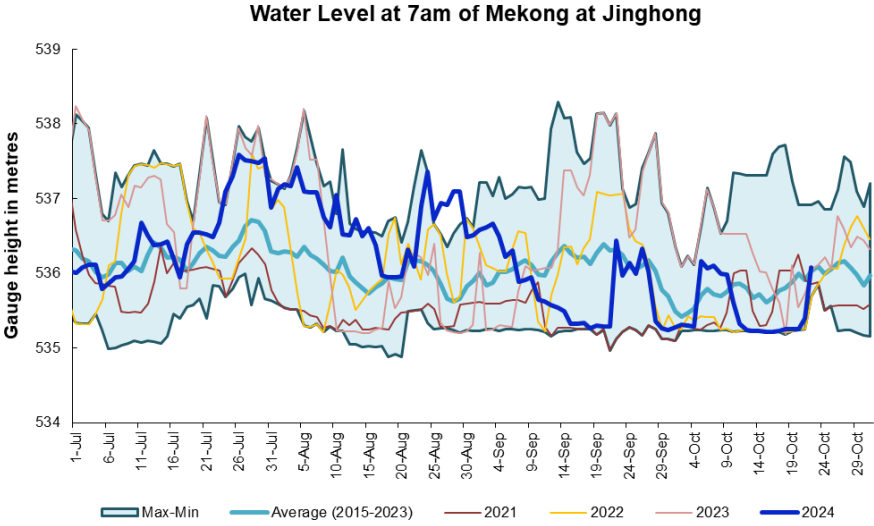


Figure 6. Water level at the Jinghong hydrological station up to 21 October 2024.

At the end of the wet season, when water levels along the Mekong River subside, the outflow of the Tonle Sap Lake (TSL) returns to the Mekong River and then to the Delta. This phenomenon normally takes place between September and October. Based on flow observation at Prek Kdam monitoring station, the inflow/reverse of the Tonle Sap Lake took place since 29 June 2024.

The outflow flow is calculated based on a formula of rating-curves using by difference of water levels at Kompong Luong and Phnom Penh Port stations for slop and Prek Kdam as cross-section of the Lake. The formula of flow is as follows:

$$Flow = WL_{Prek\ Kdam}^{1.2} \times \sqrt{|WL_{Phnom\ Penh\ Port} - WL_{Kampong\ Luong}|}$$

Where, WL is water level in m (msl).

The seasonal changes of the inflow/reverse flow and the outflow of the TSL at Prek Kdam in comparison with the flows of 2020, 2021 and 2022, 2023 and their LTA level (1997-2023) are illustrated in **Figure 7**. The reversed flow to the lake has accumulated volume of 25.49 Km³. This value has remained constant since 01 October 2024. This means that water have flowed out of the Tonle Sap Lake to the Mekong Delta.

The seasonal changes in monthly flow volumes up to 21 October 2024 for the TSL compared with that in 2020, 2021, 2022, 2023 and their LTAs, and the fluctuation levels (1997–2023) are presented in **Table 8**. The mean monthly water volume of the Tonle Sap Lake in September 2024 is lower than its LTA (about 78.39 %), 2023 but higher than 2019, 2020, 2021 and 2022

during the same period (Figure 8 and Table 1). However, updated until 21 October 2024, the volume of the lake is approximately 80.90% of its LTA in October.

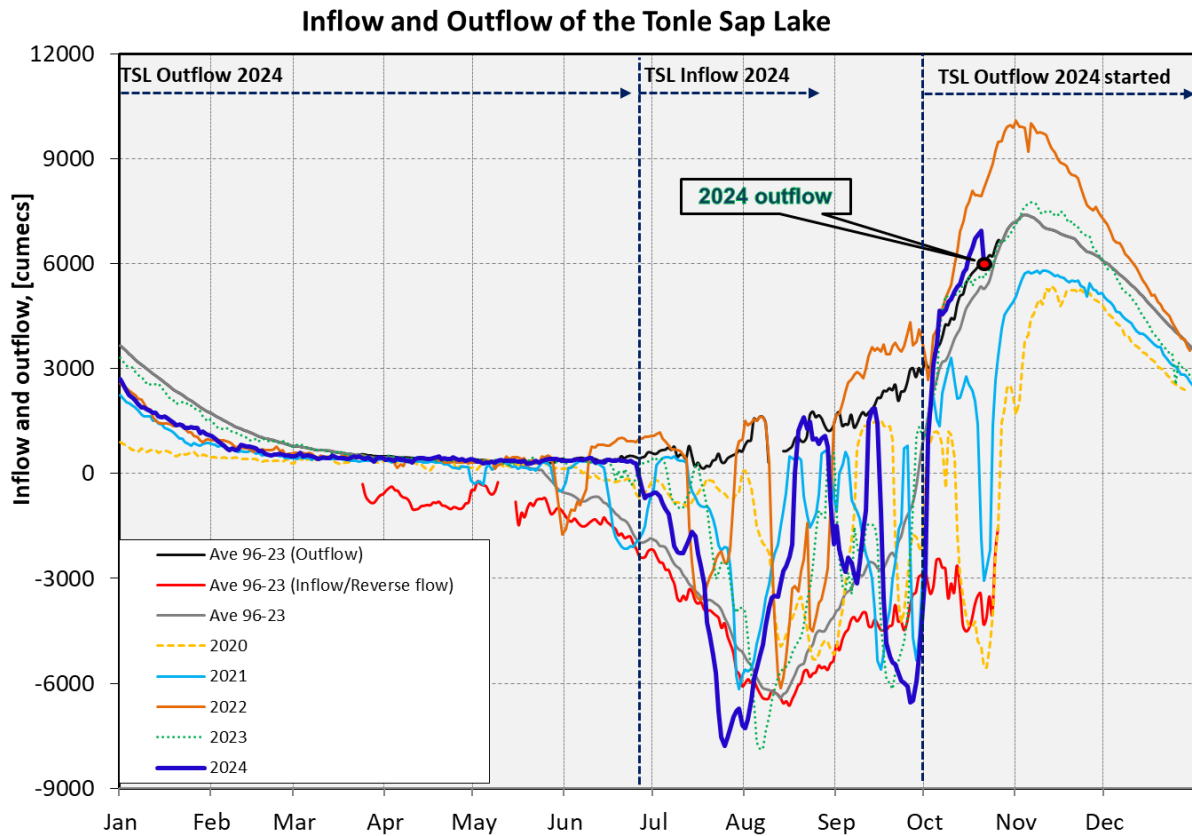


Figure 7: Seasonal change of inflows and outflows of Tonle Sap Lake.

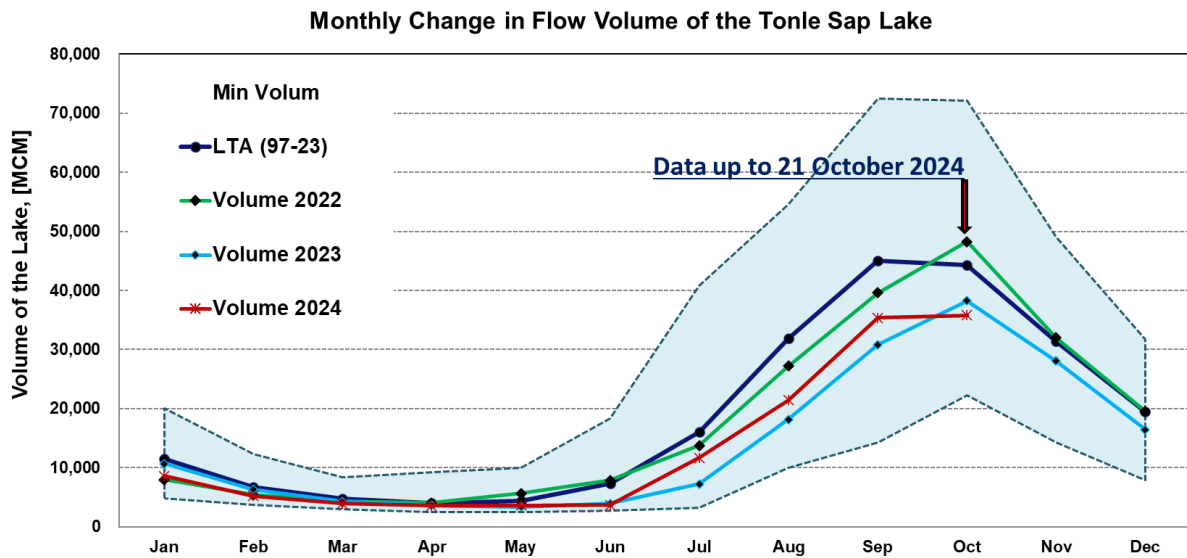


Figure 8. The seasonal change in monthly volume of Tonle Sap Lake.

Table 1. The monthly change in the flow volume of Tonle Sap Lake.

Month	LTA (97-22) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]	Volume 2022 [MCM]	Volume 2023 [MCM]	Volume 2024 [MCM]	Volume in 2024 [%], compared with its LTA
Jan	11487.13	20039.88	4796.69	7998.69	4796.69	7405.81	7998.69	10700.62	8610.88	74.96
Feb	6697.79	12266.87	3757.30	4954.90	3757.30	4671.15	5405.65	6309.00	5211.05	77.80
Mar	4822.51	8340.62	3030.40	3936.30	3259.79	4147.46	4330.50	4299.86	3936.30	81.62
Apr	4033.80	9203.09	2552.38	3317.61	2635.83	3259.79	4026.48	3609.52	3580.11	88.75
May	4376.15	9938.04	2441.69	3317.61	2469.30	3462.96	5668.52	3404.68	3609.52	82.48
Jun	7357.50	18344.65	2775.77	3580.11	2832.04	4765.22	7886.07	3936.30	3698.04	50.26
Jul	16001.18	40825.01	3230.96	4269.27	3230.96	7333.01	13751.91	7260.51	11671.87	72.94
Aug	31847.52	54529.13	10021.39	12266.87	10021.39	12453.19	27226.87	18168.63	21440.19	67.32
Sep	45088.00	72427.44	14251.59	35070.22	14251.59	22430.63	39624.67	30811.08	35343.56	78.39
Oct	44317.53	72124.19	22296.87	25074.27	28782.41	32331.33	48230.13	38255.90	35802.42	80.79
Nov	31391.74	49030.83	14302.12	14302.12	23867.31	25218.90	31989.11	28075.12		
Dec	19550.90	31734.10	7886.07	7886.07	13900.73	15599.94	19545.75	16466.19		
	Critical situation: lower than long-term minimum values (LTMIN)									
	Normal condition: within the range of long-term min (LTMIN) and max (LTMAX) values									
	Low volume situation: lower than long-term average (LTA)									
Unit: Million Cubic Meter (1 MCM= 0.001 Km ³)										

Remarks: the monthly volume of Tonle Sap Lake in 2024 is updated until 21 October 2024.

4. Flash Flood in the Lower Mekong Basin

During the weekly monitoring period from 15 – 21 October 2024, the LMB received light to moderate rain in some areas over the LMB.

According to the Southeast Asian Flash Flood Guidance System (SEAFFGS) and analysis, flash flood guidance was detected moderate to high level in the next 1, 3, and 6 hours in some areas in Cambodia the reporting period as shown in [Figure 14](#) and [Table 2](#).

Table 2. Detected moderate to high-risk flash flood in Lao PDR on 20 October

FLASH FLOOD GUIDANCE IN THE LOWER MEKONG BASIN								
In the next 1hrs			In the next 3hrs			In the next 6hrs		
Provinces	Districts	Level	Provinces	Districts	Level	Provinces	Districts	Level
Kampong Cham	Stueng Trang	High	Kampong Cham	Stueng Trang	High	Kampong Cham	Stueng Trang	High
	Kratie	Moderate	Mondul Kiri	Pechr Chenda	Moderate	Mondul Kiri	Pechr Chenda	Moderate
Mondul Kiri	Pechr Chenda	Moderate	Ratana Kiri	Koun Mom	Moderate	Ratana Kiri	Koun Mom	Moderate
Preah Vihear	Chhaeb	Moderate	Ratana Kiri	Ta Veang	Moderate	Ratana Kiri	Ta Veang	High
Ratana Kiri	Andoung Meas	Moderate	Ratana Kiri	Veun Sai	Moderate	Ratana Kiri	Veun Sai	Moderate
Ratana Kiri	Koun Mom	Moderate	Stung Treng	Sesan	Moderate	Stung Treng	Sesan	Moderate

FLASH FLOOD GUIDANCE IN THE LOWER MEKONG BASIN

In the next 1hrs			In the next 3hrs			In the next 6hrs		
Provinces	Districts	Level	Provinces	Districts	Level	Provinces	Districts	Level
Ratana Kiri	Ou Chum	Moderate	Stung Treng	Siem Pang	Moderate	Stung Treng	Siem Pang	Moderate
Ratana Kiri	Ta Veang	High	Stung Treng	Thala Barivat	Moderate	Stung Treng	Thala Barivat	Moderate
Ratana Kiri	Veun Sai	Moderate						
Stung Treng	Sesan	Moderate						
Stung Treng	Siem Pang	Moderate						
Stung Treng	Thala Barivat	Moderate						

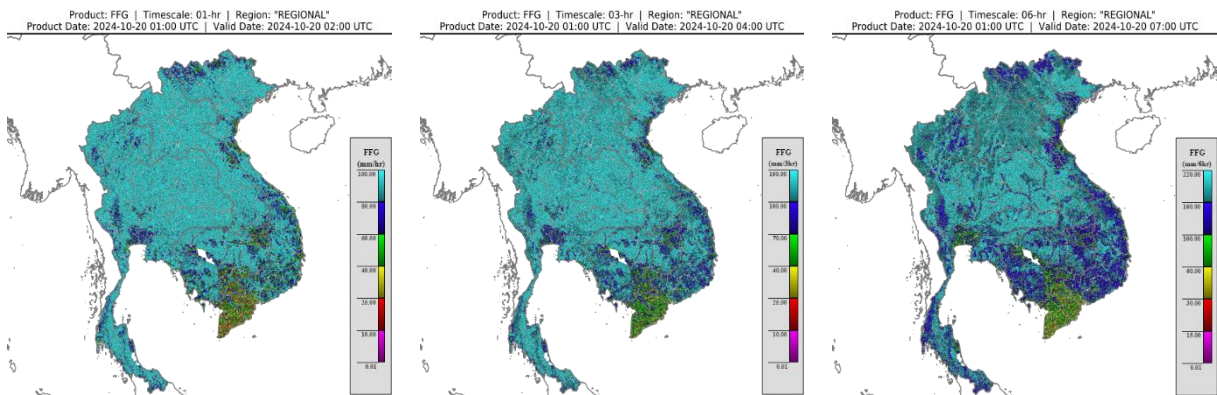


Figure 9. Flash Flood risk for the next 12-hr and 24-hr on 20 October

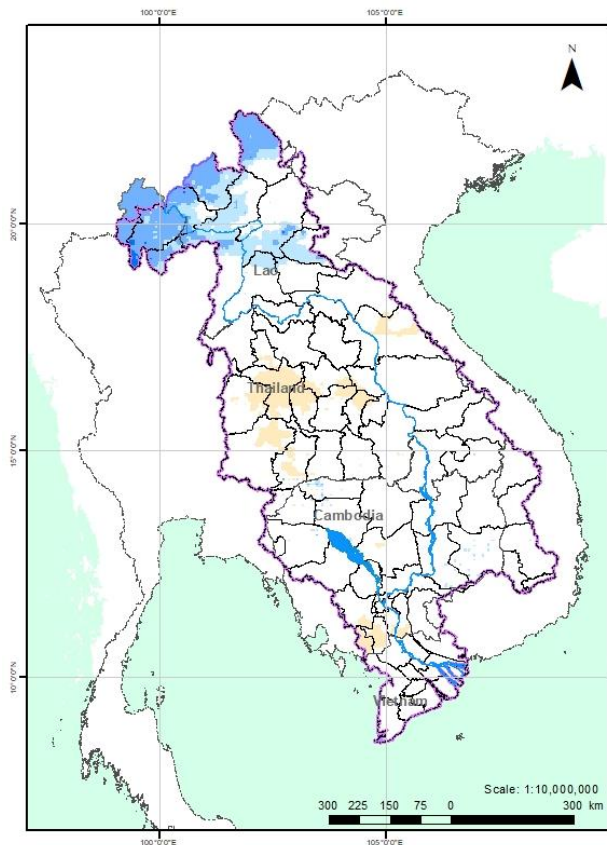
5. Drought Monitoring in the Lower Mekong Basin

5.2. Weekly drought monitoring from 15 – 21 October 2024

Drought monitoring data for 2024 are available from Monday to Sunday every week; thus, the reporting period is normally delayed by one day compared to Flood and Flash Flood reports. We adopt the Index of Soil Water Fraction (ISWF) data obtained from FFGS to represent soil moisture of agricultural indicator for both dry and wet seasons.

- **Weekly Standardised Precipitation Index (SPI1)**

As indicated in **Figure 10** below, during 15 – 21 October, the LMB is experiencing the LMB was facing normal to wet conditions, except some areas in the northeastern part of Thailand.



Drought Forecasting and Early Warning for the Lower Mekong Basin

Updated on: 14-10-2024

Weekly Forecast

Intensity (mm):



The drought monitor focus on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



Disclaimer: This drought monitoring and forecasting map is calculated based on the satellite imageries with no ground verification. MRC does not guarantee the values and accuracy of the products nor be responsible for any risks of using the products.

Figure 10: Weekly standardized precipitation index from 15 – 21 October

- **Weekly Index of Soil Water Fraction (ISWF)**

The LMB was facing a was facing a normal conditions during the monitoring week from 15 – 21 October 2024, see **Figure 10**.

Drought Forecasting and Early Warning for the Lower Mekong Basin

Updated on: 14-10-2024

Weekly Forecast

Intensity (mm):



The drought monitor focus on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



Disclaimer: This drought monitoring and forecasting map is calculated based on the satellite imageries with no ground verification. MRC does not guarantee the values and accuracy of the products nor be responsible for any risks of using the products.

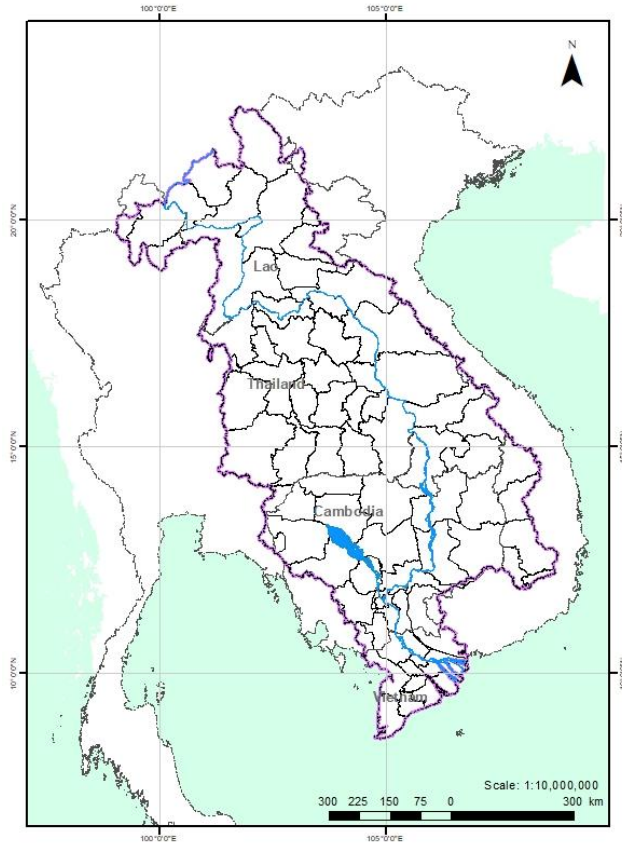


Figure 11: Weekly Index of Soil Water Fraction from 15 – 21 October.

- Weekly Combined Drought Index (CDI)**

The combined drought indicator, **Figure 11**, shows that the central part of the LMB experienced moderate drought such as Bolikhamxai, Khammouan, Savanakheth, and Salavan (Lao PDR); Nong Khai and Nakhon Phanom (Thailand).

The impacted areas are listed below:

Number	Country	Province	Mderate	Severe	Extreme	Exceptional	Number	Country	Province	Mderate	Severe	Extreme	Exceptional	Number	Country	Province	Mderate	Severe	Extreme	Exceptional
1	Cambodia	Battambang					24	Lao PDR	Oudomxai					47	Thailand	Udon Thani				
2	Cambodia	Banteay Meanchey					25	Lao PDR	Loungprabang					48	Thailand	Sakon Nakhon				
3	Cambodia	Kampong Cham					26	Lao PDR	Xayaburi					49	Thailand	Bueng Kan				
4	Cambodia	Pursat					27	Lao PDR	Xiengkhouang					50	Thailand	Nakhon Phanom		S		
5	Cambodia	Kampong Chhnang					28	Lao PDR	Vientiane					51	Thailand	Kalasin				
6	Cambodia	Otdar Meanchey					29	Lao PDR	Vientiane Capital					52	Thailand	Mukdahan				
7	Cambodia	Preah Vihear					30	Lao PDR	Xaisomboun					53	Thailand	Roi Et				
8	Cambodia	Kampong Thom					31	Lao PDR	Borikhamxai		S	S		54	Thailand	Yasothon				
9	Cambodia	Kratie					32	Lao PDR	Khammouan		S			55	Thailand	Amnat Charoen				
10	Cambodia	Mondulkiri					33	Lao PDR	Savanakheth		S			56	Thailand	Ubon Ratchathani				
11	Cambodia	Ratanakiri					34	Lao PDR	Salavan		S			57	Thailand	Si Sa Ket				
12	Cambodia	Tbong Khmum					35	Lao PDR	Xekong		S			58	Thailand	Surin				
13	Cambodia	Prey Veng					36	Lao PDR	Attapu					59	Thailand	Buri Ram				
14	Cambodia	Kampot					37	Lao PDR	Champasack					60	Thailand	Nakhon Ratchasima				
15	Cambodia	Takeo					38	Thailand	Chiang Mai					61	Viet Nam	Kon Tum				
16	Cambodia	Svai Rieng					39	Thailand	Chiang Rai					62	Viet Nam	Gia Lai				
17	Cambodia	Stung Treng					40	Thailand	Payao					63	Viet Nam	Dak Nong				
18	Cambodia	Kampong Speu					41	Thailand	Loei					64	Viet Nam	Dak Lak				
19	Cambodia	Kandal					42	Thailand	Nong Bua Lam Phu					65	Viet Nam	Dong Thap				
20	Cambodia	Siem Reap					43	Thailand	Khon Kaen					66	Viet Nam	Tien Giang				
21	Lao PDR	Bokeo					44	Thailand	Nong Khai		S			67	Viet Nam	An Giang				
22	Lao PDR	Luangnamtha					45	Thailand	Chaiyaphum					Other provinces of the Mekong Delta of Viet Nam have no data						
23	Lao PDR	Phongsali					46	Thailand	Maha Sarakham											

Note: S: short-term drought, less than 1 months; L: long-term drought, more than 1 month

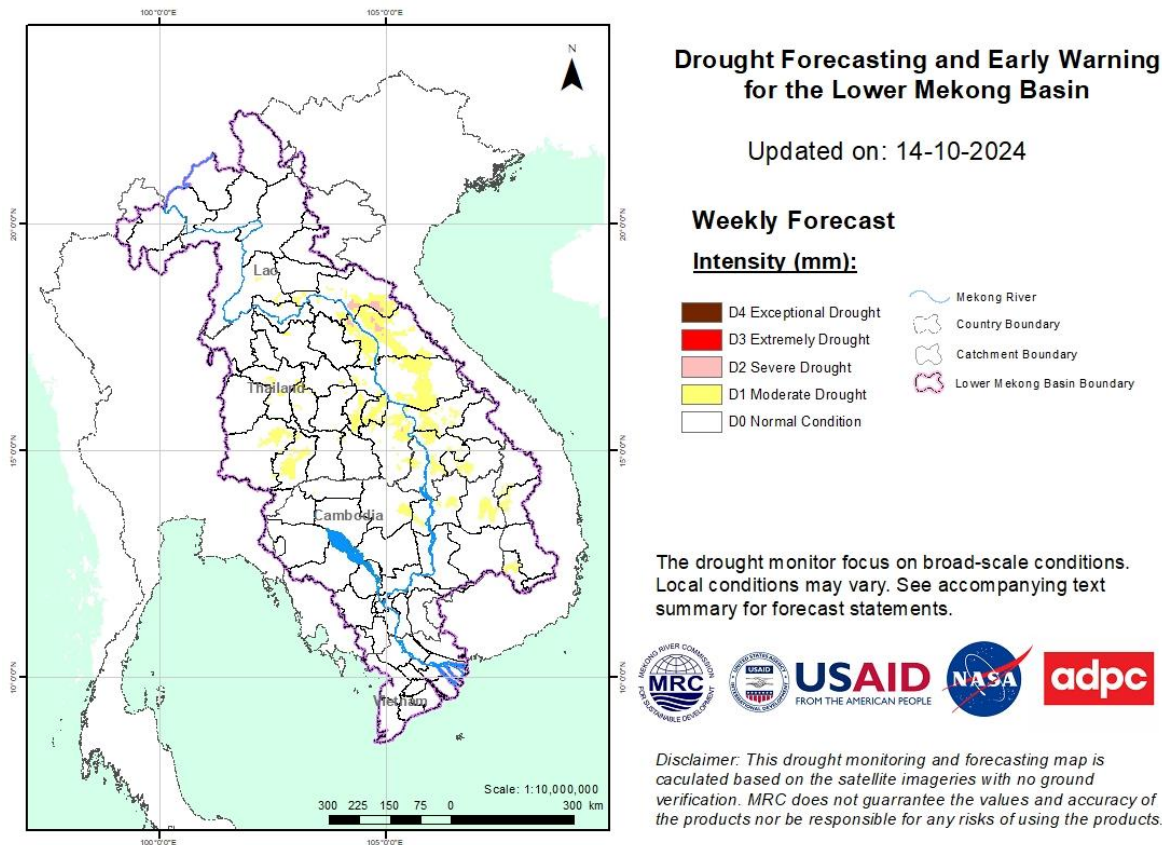


Figure 12: Weekly Combined Drought Index from 15 – 21 October.

More information on Drought Forecasting and Early Warning (DFEW) as well as the explanation is available here: <http://droughtforecast.mrcmekong.org/templates/view/our-product>. DFEW provides not only weekly monitoring and forecasting information but also a three-month forecast of drought indicators with seasonal outlook which are updated every month based on international weather forecast models. Details on drought forecast are described in section 6.4 of this report.

6 Weather and Water Level Forecast and Flash Flood information

6.1 Rainfall forecast

From 22 - 26 October 2024, the accumulated rainfall over the entire Lower Mekong Basin is distributed with light to moderate rain based on CHIRPS-GFS (**Figure 12**). The accumulated rainfall over the entire Lower Mekong Basin is distributed with light to moderate rain is expected over the Lower Mekong Basin.

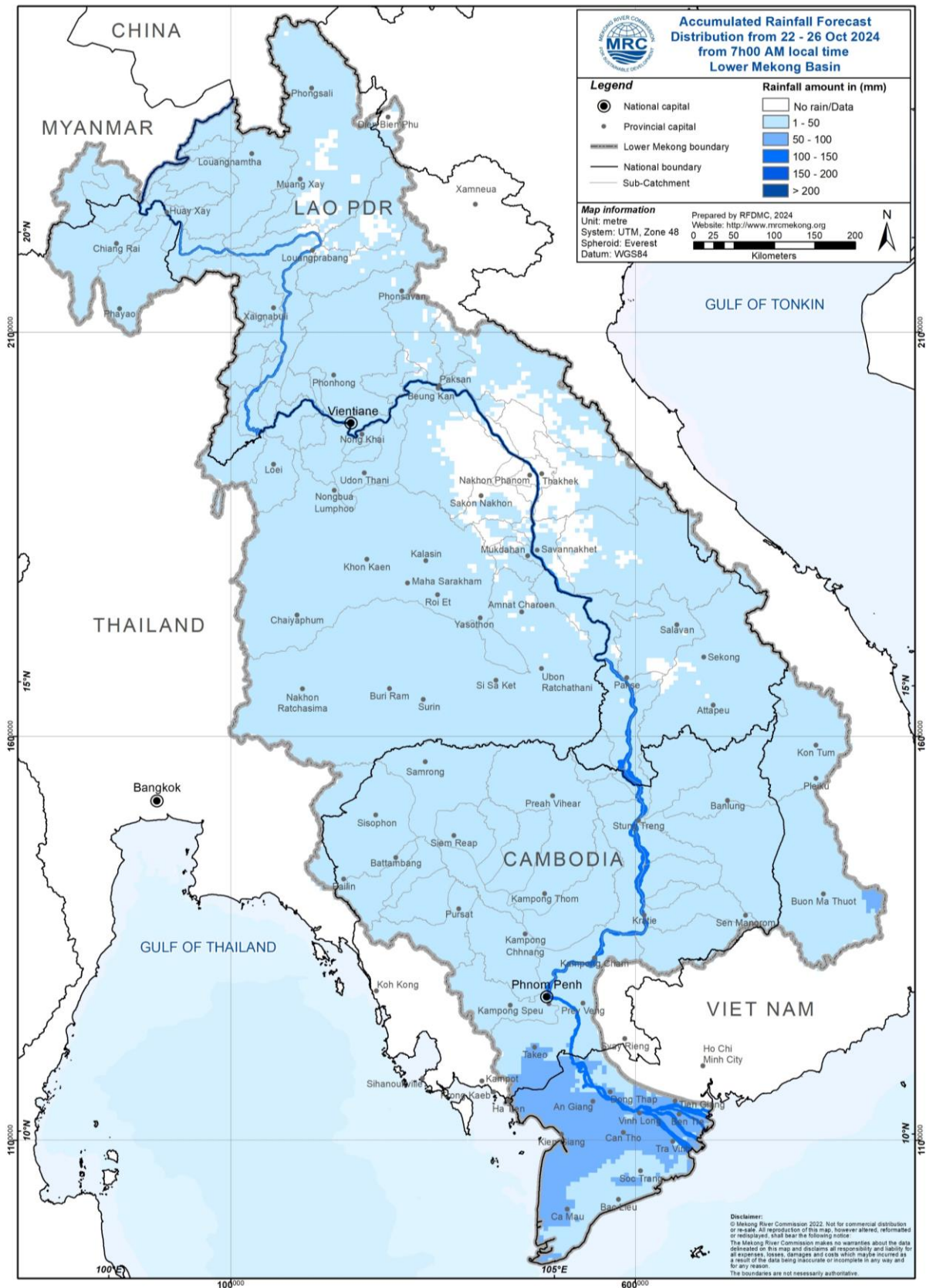


Figure 13: Accumulated rainfall forecast from CHIRPS-GEFS (22 – 26 October 2024)

6.2 Water level forecast

The five-day forecast is carried out from 22 to 26 October 2024 for 22 forecasting stations along the Mekong mainstream. Overall, water levels at all stations along the Mekong mainstream are expected to decrease except for Chiang Saen station. At Chiang Saen, water level is expected to rise approximately 0.13 m, while at Luang Prabang station, water level is expected to stay stable.

At Chiang Khan, Vientiane, Nongkhai, Paksane, Nakhon Phanom, and Mukdahan stations, water levels are expected to drop with approximated value of -0.35 m, -0.48 m, -0.58 m, -0.58 m, -0.42 m, -0.39 m, and -0.35 m, respectively. Moreover, Khong Chiam, Pakse, Stung Treng, Kratie, Kompong Cham, Phnom Penh (Bassac), Phnom Penh Port, Koh Khel, Neak Luong, and Prek Kdam, water levels are expected to drop approximately -0.34 m, -0.35 m, -0.44 m, -0.63 m, -0.39 m, -0.11 m, -0.11 m, -0.12 m, -0.17 m, and -0.06 m, respectively.

For the Tan Chau station on the Mekong River and Chau Doc station on the Bassac River, water levels are also expected to be rise as well. At Tan Chau, water level will decrease approximately -0.09 m, while at Chau Doc -0.07 m. Chau Doc station.

The weekly River Monitoring Bulletin and forecasting issued on 21 October 2024 can be found in **Table 2**. Results of the weekly river monitoring and forecasting bulletin are also available at <http://ffw.mrcmekong.org/bulletin.php>

Table 3. River Monitoring and Forecasting Bulletin

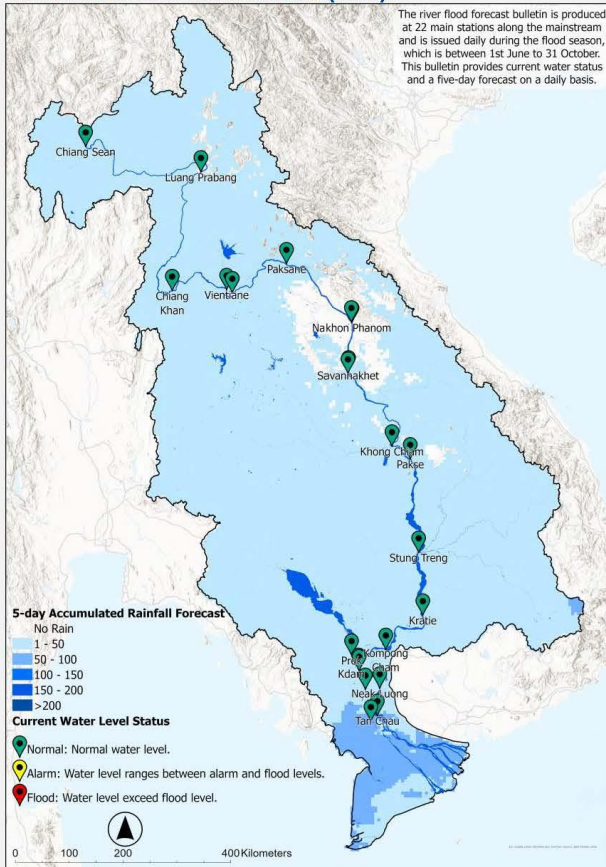


MEKONG RIVER MONITORING AND FORECASTING BULLETIN

Monitoring on 21 October 2024, 7:00 (UTC+7)

Highlights: Water levels at most stations along the Mekong mainstream have either decreased or been stable except for Kratie, Kompong Cham and Phnom Penh (Bassac) stations. The **total volume of accumulated reverse flow to Tonle Sap Lake has remained constant.**

THE FORECASTING HYDROLOGICAL STATION MAP OF THE LOWER MEKONG BASIN (LMB)



Remarks: The river flood forecast bulletin is produced at 22 main stations along the mainstream and is issued daily during the flood season, which runs from 1st June to 31st October. This bulletin provides information on the current water level status and a five-day forecast on a daily basis.

WATER LEVEL STATUS DEFINITIONS

Normal	Normal water level.
Alarm	Alarm when the water level ranges between alarm and flood levels.
Flood	Flood is when the flood level exceeds. A flood level is determined by member countries.

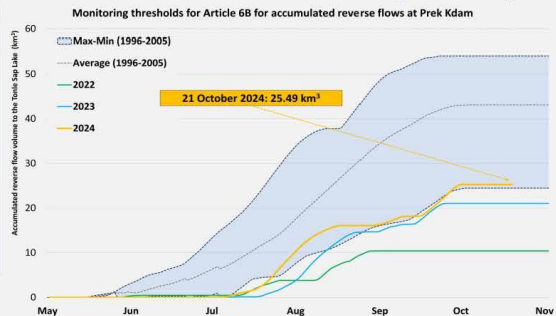
CURRENT WATER LEVEL STATUS

Monitoring Station	Water Level	Flow Threshold (PMFM*6C)
Jinghong	-	-
Chiang Saen	Normal	Normal
Luang Prabang**	Normal	-
Chiang Khan	Normal	-
Vientiane	Normal	Normal
Nongkhai	Normal	-
Paksane	Normal	-
Nakhon Phanom	Normal	-
Thakhek	Normal	-
Mukdahan	Normal	-
Savannakhet	Normal	-
Khong Chiam	Normal	Normal
Pakse	Normal	Normal
Stung Treng	Normal	Normal
Kratie	Normal	Normal
Kompong Cham	Normal	-
Phnom Penh (Bassac)	Normal	-
Phnom Penh Port	Normal	-
Koh Khe	Normal	-
Neak Luong	Normal	-
Prek Kdam	Normal	-
Tan Chau	Normal	-
Chau Doc	Normal	-

* Procedures for Maintenance of Flows on the Mainstream

** Luang Prabang station is influenced by hydropowers at its upstream and downstream

REVERSE FLOW VOLUME PREK K DAM (PMFM*6B)



Accumulated reverse flow volume at Prek Kdam

Flow volumes on 21 October 2024:	25.49 Km ³
Minimum reverse flow volume (1996-2005):	23.848 Km ³
Average reverse flow volume (1996-2005):	42.84 Km ³
Maximum reverse flow volume (1996-2005):	54.046 Km ³

*Procedures for Maintenance of Flows on the Mainstream

MRC Secretariat, Vientiane, Lao PDR | E: mrcs@mrcmekong.org | T: +856 21 263 263
 MRC Regional Flood and Drought Management Centre, Phnom Penh, Cambodia |
 E: floodforecast@mrcmekong.org | T: +855 23 425 353

<http://www.mrcmekong.org/>
http://fw.mrcmekong.org/bulletin_wet.php
<http://fw.mrcmekong.org/reportflood.php>
<https://pmfm.mrcmekong.org/>

DISCLAIMER

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MEKONG RIVER MONITORING AND FORECASTING BULLETIN

Forecasting from 22 to 26 October 2024

Highlights: *Isolated heavy rain may occur in some areas in the lower part of the LMB including Cambodia and the Mekong Delta from 21 to 24 October. Water Levels at almost stations are expected to decrease gradually except for Chiang Saen station.*

Forecasting Station	24 h Observed Rainfall (mm)	Zero gauge above M.S.L (m)	Observed Water Level against zero gauge (m)		Forecasted Water Level (m)					Alarm Level (m)	Flood Level (m)	Forecasted Water Levels Change in 5 days (m)	Max. Water levels change within next 5 days (m)	Min. distance to alarm level within next 5 days (m)	Min. distance to flood level within next 5 days (m)	
			20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct							
★ Jinghong	0.0	-	535.39	↑ 536.08	-	-	-	-	-	-	-	-	-	-	-	-
Chiang Saen	14.6	357.110	3.12	↓ 3.07	→ 2.97	→ 2.89	→ 2.97	↑ 3.11	→ 3.20	11.50	12.80	↑	0.13	0.13	8.30	9.60
Luang Prabang	0.0	267.195	10.48	↓ 10.34	→ 10.24	→ 10.18	→ 10.17	→ 10.24	↑ 10.35	17.50	18.00	→	0.01	-0.17	7.15	7.65
Chiang Khan	2.0	194.118	8.03	↓ 7.97	↓ 7.86	↓ 7.74	→ 7.65	→ 7.59	→ 7.62	14.50	16.00	↓	-0.35	-0.38	6.64	8.14
Vientiane	0.0	158.040	4.92	↓ 4.76	↓ 4.59	↓ 4.44	→ 4.34	→ 4.29	→ 4.28	11.50	12.50	↓	-0.48	-0.48	6.91	7.91
Nongkhai	0.0	153.648	5.23	↓ 4.96	↓ 4.78	↓ 4.64	→ 4.52	↓ 4.42	→ 4.38	11.40	12.20	↓	-0.58	-0.58	6.62	7.42
Paksane	0.0	142.125	6.33	↓ 6.24	→ 6.16	↓ 5.98	→ 5.82	↓ 5.72	→ 5.66	13.50	14.50	↓	-0.58	-0.58	7.34	8.34
Nakhon Phanom	0.7	130.961	5.54	↓ 5.40	↓ 5.30	→ 5.21	→ 5.11	→ 5.03	→ 4.98	11.50	12.00	↓	-0.42	-0.42	6.20	6.70
Thakhek	0.6	129.629	6.66	↓ 6.53	→ 6.44	→ 6.38	→ 6.27	→ 6.19	→ 6.14	13.00	14.00	↓	-0.39	-0.39	6.56	7.56
Mukdahan	0.0	124.219	5.35	↓ 5.20	→ 5.12	→ 5.08	→ 4.99	→ 4.90	→ 4.85	12.00	12.50	↓	-0.35	-0.35	6.88	7.38
Savannakhet	0.0	124.219	3.79	↓ 3.64	→ 3.57	→ 3.53	→ 3.44	→ 3.35	→ 3.29	12.00	13.00	↓	-0.35	-0.35	8.43	9.43
Khong Chiam	0.0	89.030	6.60	↓ 6.50	→ 6.35	→ 6.29	→ 6.27	→ 6.20	→ 6.16	13.50	14.50	↓	-0.34	-0.34	7.15	8.15
Pakse	0.0	86.490	5.00	↓ 4.92	↓ 4.82	↓ 4.77	→ 4.73	↓ 4.65	↓ 4.58	11.00	12.00	↓	-0.35	-0.35	6.18	7.18
Stung Treng	1.0	36.790	5.97	↓ 5.82	↓ 5.71	↓ 5.62	→ 5.53	↓ 5.46	↓ 5.38	10.70	12.00	↓	-0.44	-0.44	4.99	6.29
Kratie	31.6	-0.101	14.12	↑ 14.33	↓ 14.15	↓ 13.91	→ 13.81	↓ 13.75	↓ 13.70	22.00	23.00	↓	-0.63	-0.63	7.85	8.85
Kompong Cham	19.0	-0.930	9.06	↑ 9.18	↓ 9.11	↓ 8.96	→ 8.85	→ 8.82	↓ 8.79	15.20	16.20	↓	-0.39	-0.39	6.09	7.09
Phnom Penh (Bassac)	7.2	-1.020	7.19	↑ 7.23	↑ 7.29	↓ 7.25	→ 7.18	↓ 7.14	→ 7.12	10.50	12.00	↓	-0.11	-0.11	3.21	4.71
Phnom Penh Port	nr	0.070	6.02	→ 6.04	↑ 6.10	↓ 6.06	→ 5.99	↓ 5.95	→ 5.93	9.50	11.00	↓	-0.11	-0.11	3.40	4.90
Koh Khel	0.0	-1.000	6.45	↓ 6.42	→ 6.42	↓ 6.38	→ 6.33	→ 6.31	→ 6.30	7.90	8.40	↓	-0.12	-0.12	1.48	1.98
Neak Luong	4.9	-0.330	5.28	→ 5.28	→ 5.27	↓ 5.23	→ 5.17	↓ 5.13	→ 5.11	7.50	8.00	↓	-0.17	-0.17	2.23	2.73
Prek Kdam	15.3	0.080	6.79	→ 6.81	→ 6.82	→ 6.81	→ 6.78	→ 6.76	→ 6.75	9.50	10.00	↓	-0.06	-0.06	2.68	3.18
★ Tan Chau	nr	0.000	2.81	↓ 2.72	↓ 2.68	→ 2.68	→ 2.67	→ 2.65	→ 2.63	3.50	4.50	↓	-0.09	-0.09	0.82	1.82
★ Chau Doc	3.6	0.000	2.75	↓ 2.62	↓ 2.58	→ 2.58	→ 2.58	→ 2.57	→ 2.55	3.00	4.00	↓	-0.07	-0.07	0.42	1.42

WATER LEVEL FORECASTING DEFINITIONS

↑	Rising water level.
→	Stable water level: stable water level is defined as a daily change of less than 10cm from Chaing Saen to Savannakhet; less than 5cm at Pakse and Stung Treng; and no more than 3cm from Kratie downstream.
↓	Falling water level.
X	No data available.
Alarm stage	Alarm stage is when the water level ranges between alarm and flood levels.
Flood stage	Flood stage is when the flood level exceeds. A flood level is determined by member countries.

NOTES

- On 21 October, water levels at most of stations have either dropped or been stable except for Kratie, Kompong Cham, and Phnom Penh (Bassac). The total volume of accumulated reverse flow to Tonle Sap Lake has remained constant (25.49 Km³) since 01 October 2024.
- For 22-26 October, light to moderate rain is expected over the Lower Mekong Basin (LMB). However, isolated heavy rain may occur in some areas in the lower part of the LMB including Cambodia and the Mekong Delta from 21 to 24 October.
- For 22-26 October, water Levels at all most stations along the Mekong mainstream are expected to drop except for Chaing Saen station.

MRC Secretariat, Vientiane, Lao PDR | E: mrc@mrcmekong.org | T: +856 21 263 263
MRC Regional Flood and Drought Management Centre, Phnom Penh, Cambodia |
E: floodforecast@mrcmekong.org | T: +855 23 425 353

<http://www.mrcmekong.org/>
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6.3 Flash Flood Information

With the predicted rainfall for the coming week, flash floods might be detected in some areas in the LMB. Local heavy rain in a short period of time is possible with unpredictable short flash floods.

Further detailed information on Flash Flood Guidance Information, as well as its explanation, is available for download [here](#).

6.4 Drought forecast

There are several climate-prediction models with different scenarios in the upcoming months. The MRC’s DFEWS adopts the global scale of North America Multi-Model Ensemble (NMME) for the seasonal outlook of rainfall.

Figure 13 below shows the monthly forecasts of combined drought indicator from October to December 2024 over the LMB area.

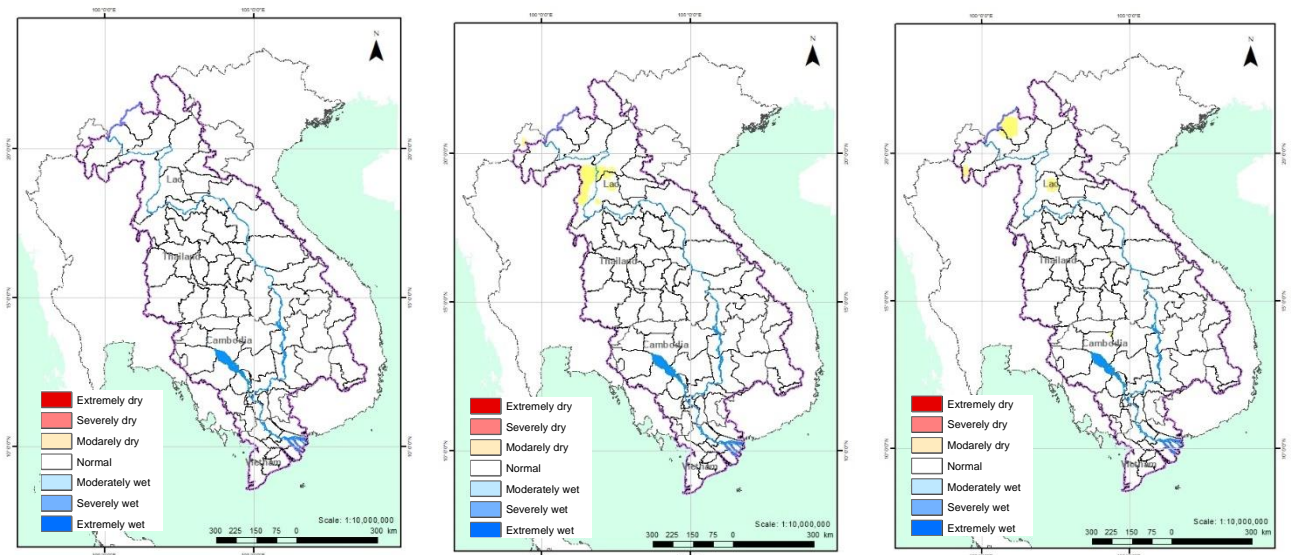


Figure 14. Monthly forecasts of combined drought indicator for a) October, b) November and c) December 2024.

Figure 14 illustrates the monthly drought forecast for the upcoming three months using the Combined Drought Indicator (CDI). The forecast indicates that no significant drought conditions are expected across the entire LMB during this period. However, in November 2024, the upper part of the LMB, including Xayabouly province, is anticipated to experience moderate drought conditions; and in December, Luang Namtha province, is anticipated to experience moderate drought conditions.

7 Summary and Possible Implications

7.1. Rainfall and its forecast

In the period of 15 – 21 October 2024, light to moderate rainfall has been observed over the LMB. Especially, heavy rain occurred in some areas in Chiang Saen, Svay Chrea, Stung Chinit, Oudor Meanchey, Svay Chrea, Bassac Chaktomuk, Snoul, Sesan, Mdrak.

From 22 – 28 October 2024, Light to moderate rain is expected over the Lower Mekong Basin. However, heavy rain may occur in some areas in the central and lower part of Lao PDR from 27 - 28 October.

7.2. Water level and its forecast

At 22 key monitoring stations along the Mekong mainstream from 15 – 21 October 2024, water levels at all stations along the Mekong mainstream have decreased. However, water levels are in normal conditions. The total accumulated volume of the reverse flow to Tonle Sap Lake remains 25.49 Km³. This value has remained constant since 01 October 2024

In the period of 21 – 25 October 2024, water levels at almost all stations along Mekong mainstream from are likely expected to drop except for Chiang Saen station.

7.3. Flash flood and its trends

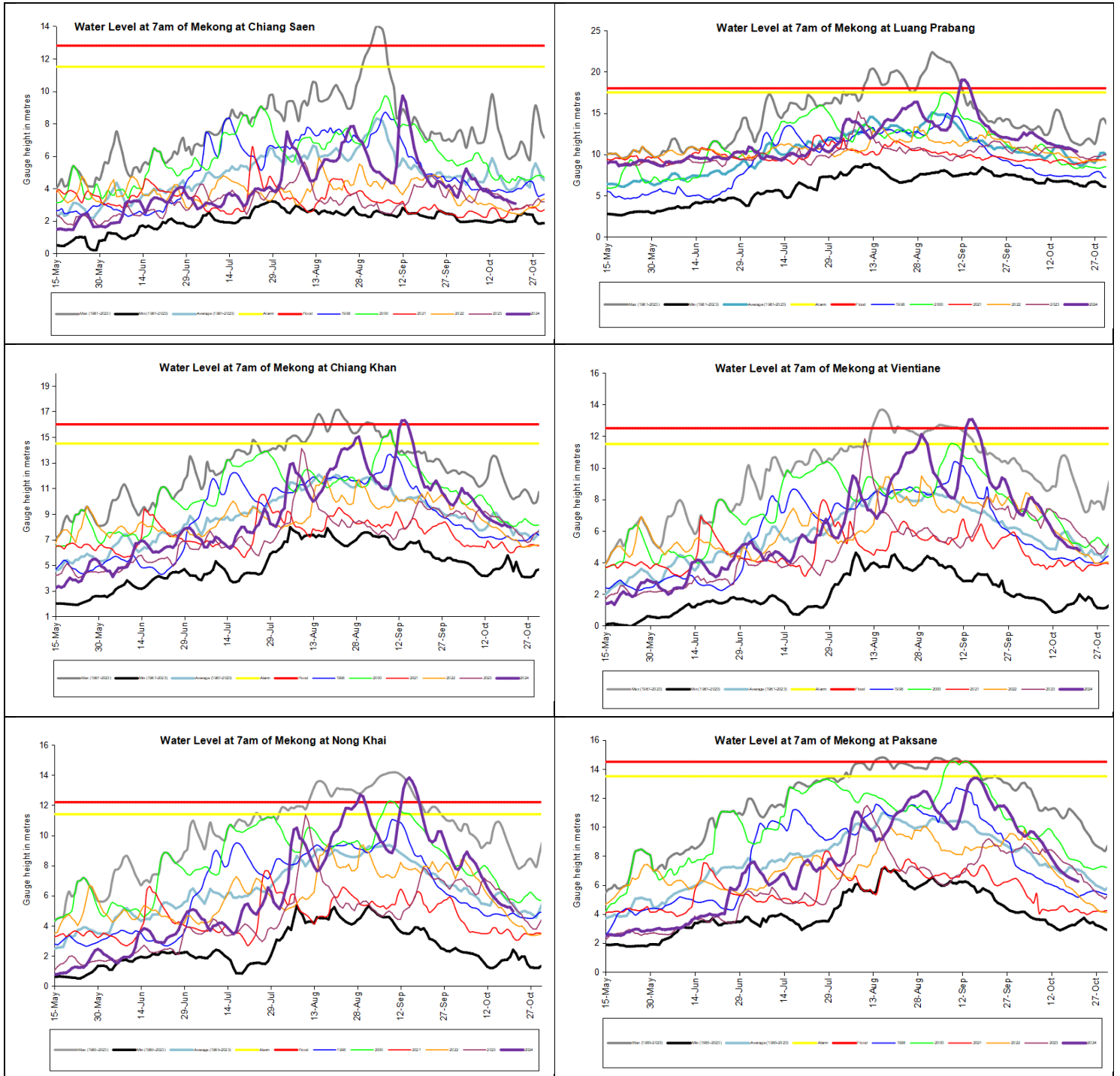
With the predicted of rainfall for the coming week as mentioned earlier in part 2, the flash flood guidance at a low to high level will likely be detected in some areas of the LMB.

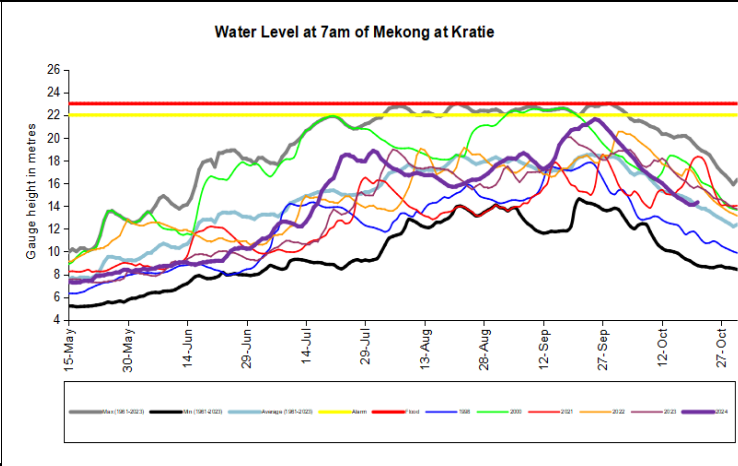
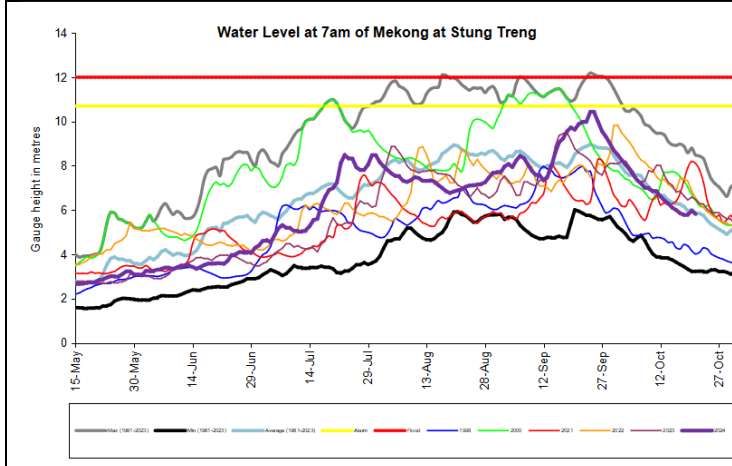
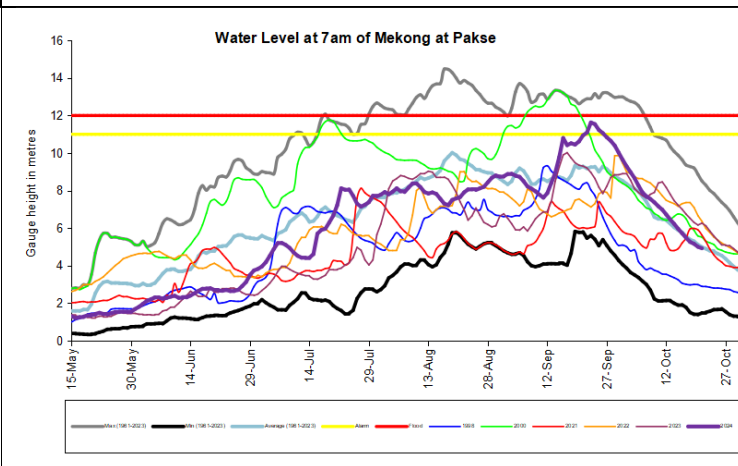
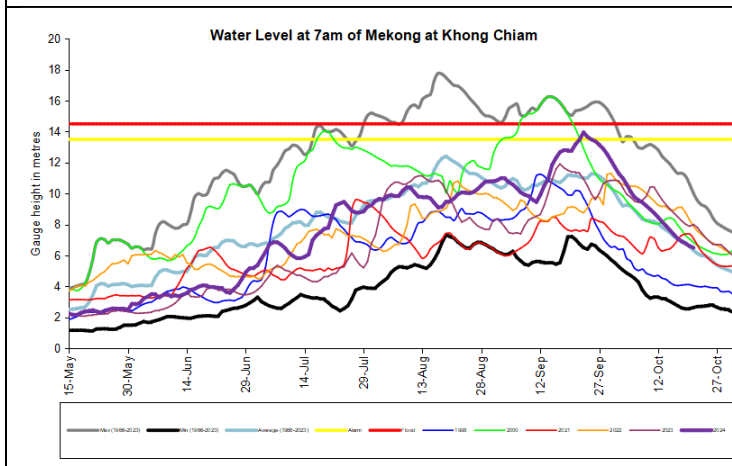
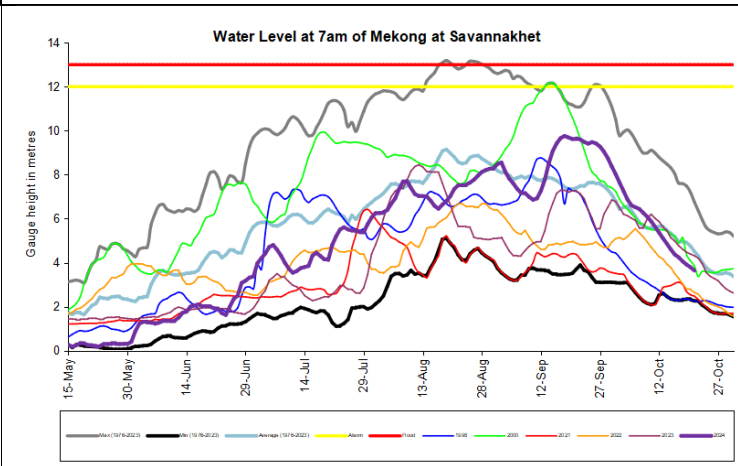
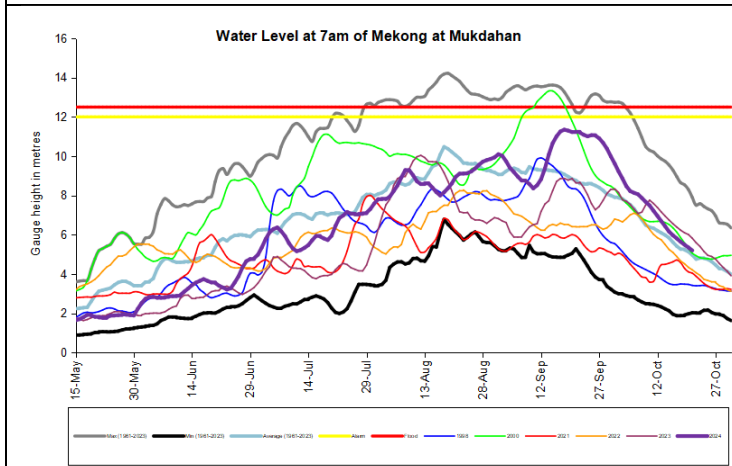
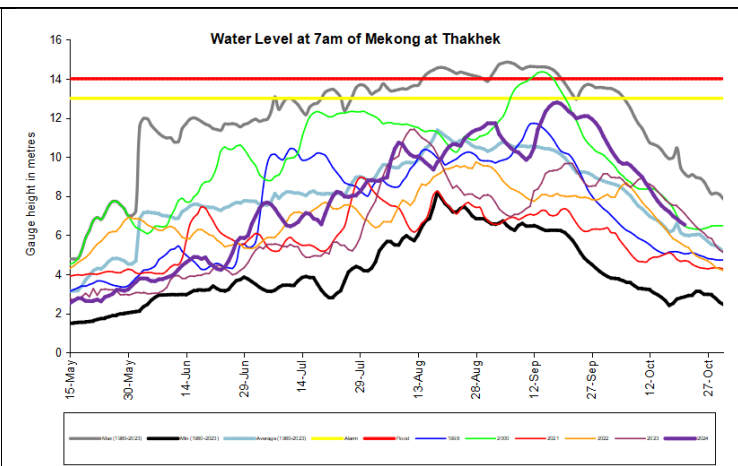
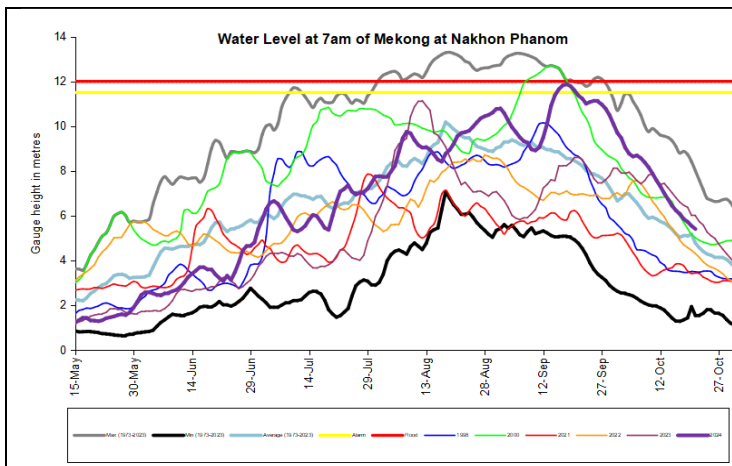
7.4. Drought condition and its forecast

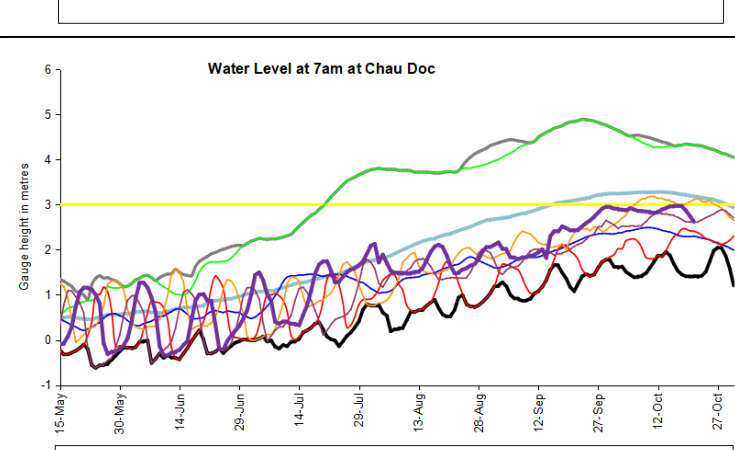
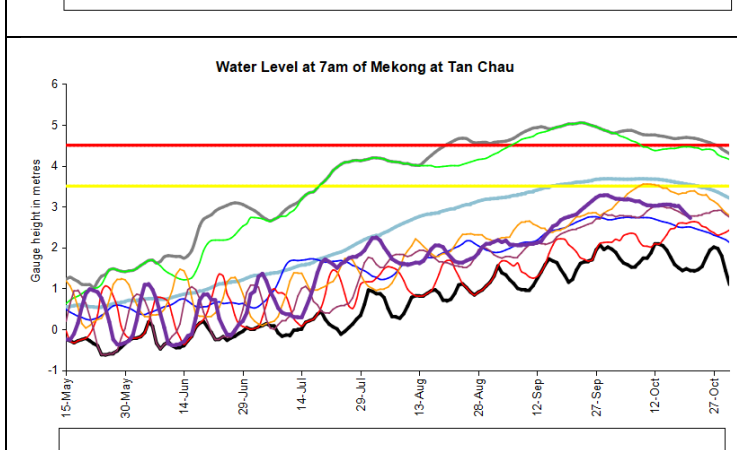
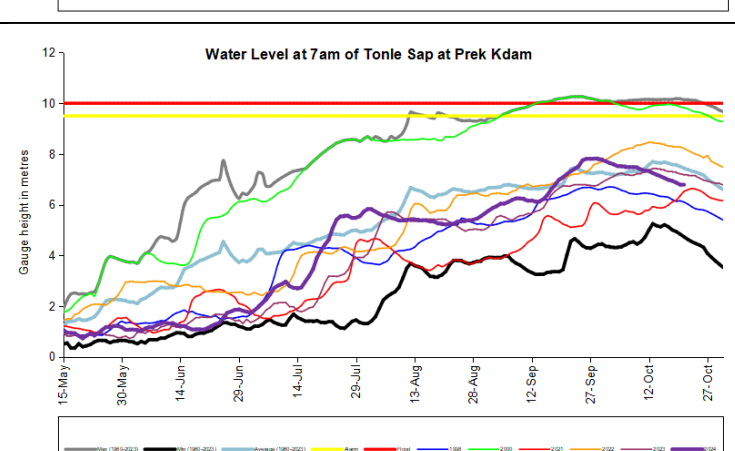
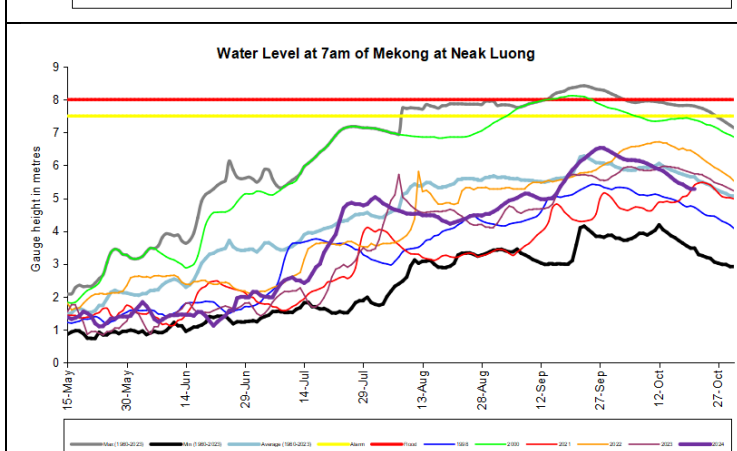
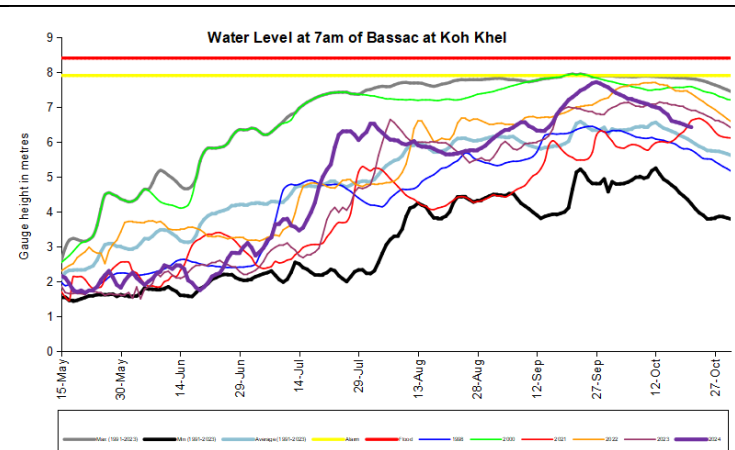
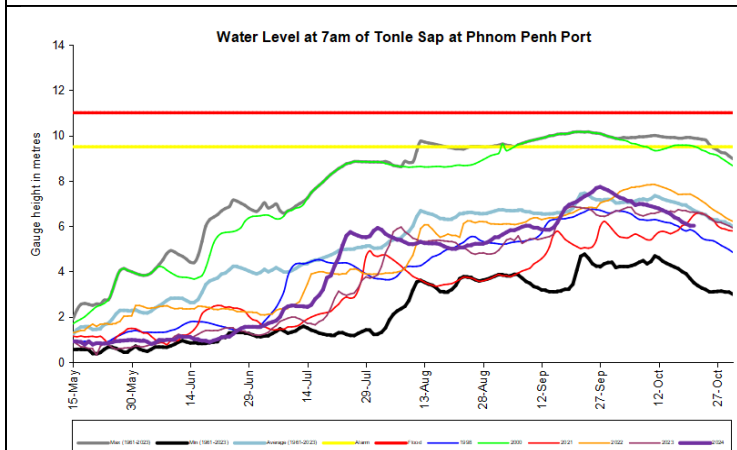
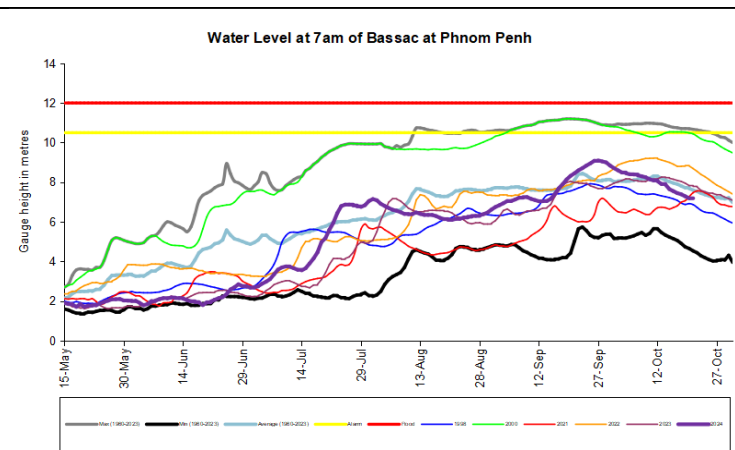
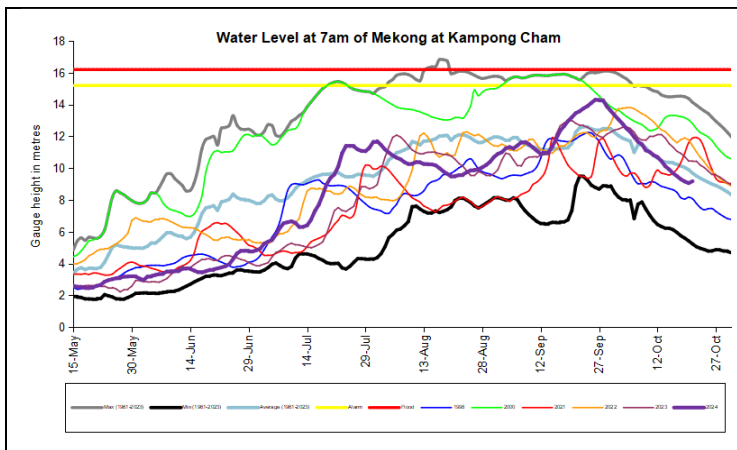
From 15 – 21 October 2024, the LMB is experiencing normal to wet conditions, except for some areas in the northeastern of Thailand. The observed drought was caused primarily by meteorological indicator. From 22 – 28 October, the LMB is likely at normal conditions. No drought is forecasted for the whole region, except for some arears in Khammouan and Savanakheth (Lao PDR).

From October to December 2024, the forecast indicates that no significant drought conditions are expected across the entire LMB during this period. However, in November 2024, the upper part of the LMB, including Xayabouly province, is anticipated to experience moderate drought conditions; and in December, Luang Namtha province, is anticipated to experience moderate drought conditions.

Annex A: Weekly water level monitoring at the 22 key stations







Annex B: Tables for weekly updated water levels and rainfall at the Key Stations

Table A1: Weekly observed water levels

2024	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
15-10-2024	535.22	3.46	10.94	8.42	5.42	5.76	7.00	6.44	7.51	6.16	4.60	7.63	5.96	6.11	15.02	9.92	7.65	6.54	6.78	5.64	7.12	3.05	2.96
16-10-2024	535.22	3.43	10.94	8.32	5.23	5.53	6.83	6.23	7.33	5.97	4.37	7.35	5.72	6.00	14.74	9.68	7.55	6.39	6.60	5.54	7.05	3.03	2.97
17-10-2024	535.23	3.31	10.78	8.22	5.01	5.38	6.65	6.08	7.19	5.81	4.24	7.08	5.48	5.86	14.56	9.50	7.45	6.32	6.57	5.46	6.98	3.01	2.97
18-10-2024	535.25	3.30	10.80	8.08	4.95	5.32	6.52	5.85	6.97	5.64	4.06	6.90	5.26	5.78	14.32	9.30	7.39	6.18	6.54	5.42	6.94	3.02	2.96
19-10-2024	535.25	3.20	10.66	8.18	4.90	5.23	6.42	5.72	6.83	5.49	3.91	6.76	5.16	5.79	14.11	9.16	7.29	6.10	6.50	5.34	6.87	2.91	2.87
20-10-2024	535.39	3.12	10.48	8.03	4.92	5.23	6.33	5.54	6.66	5.35	3.79	6.60	5.00	5.97	14.12	9.06	7.19	6.02	6.45	5.28	6.79	2.81	2.75
21-10-2024	536.08	3.07	10.34	7.97	4.76	4.96	6.24	5.40	6.53	5.20	3.64	6.50	4.92	5.82	14.33	9.18	7.23	6.04	6.42	5.28	6.81	2.72	2.62
Flood level		12.80	18.00	16.00	12.50	12.00	14.50	12.50	14.00	12.50	13.00	14.50	12.00	12.00	23.00	16.20	12.00	11.00	7.90	8.00	10.00	4.50	4.00

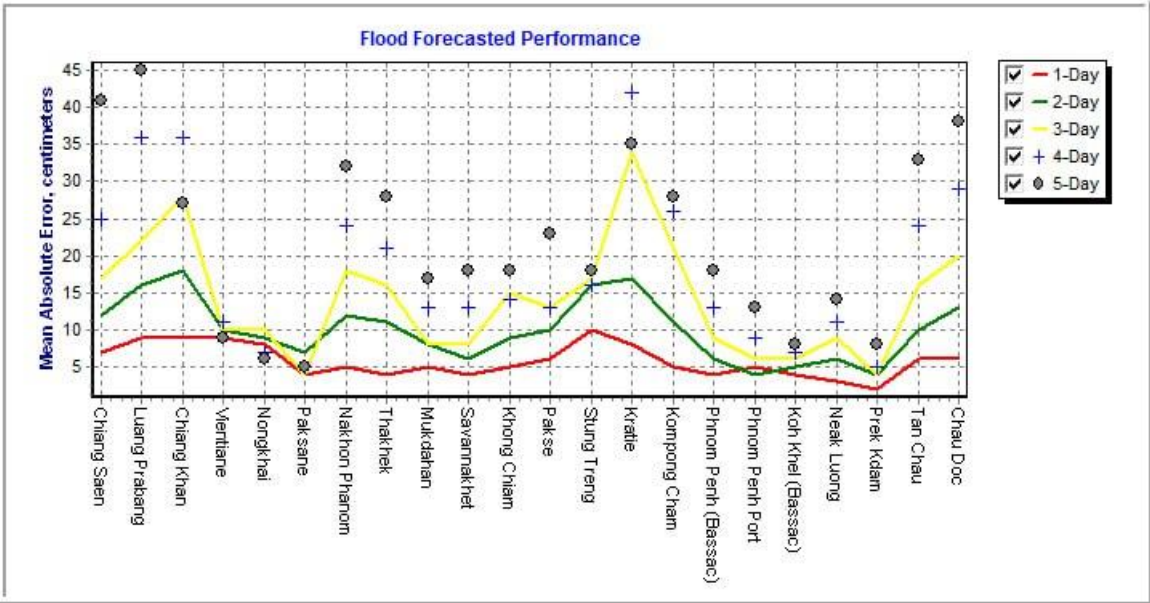
Table A2: Weekly observed rainfall

2024	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Thakhek	Mukdahan	Savannakhet	Khong Chiam	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Phnom Penh Port	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc	
15-10-2024	0.5	93.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3
16-10-2024	3	0	0	0	0	0	0	0	0	0	0	0	0	61	22.7	0	33.5	0	12.4	0.6	9.2	10	2	
17-10-2024	0.5	0	0	0	0	0	0	0	1	0	0	0	2	1.5	25.5	0	2.5	0	44	0.2	0	0	2	
18-10-2024	0	0	0	0	0	0	0	0	0	0	0	18.5	0	3	35.2	28	4.9	0	7.4	4	13.4	56.3	7	
19-10-2024	0	0	0	13.5	0	0	0	0	0	0	0	18.8	0	25	6	3	36.3	0	12.5	4.2	7.3	0	2	
20-10-2024	0	31.8	0	4.4	0	0	0	0	0	0	0	8.3	0	10	0	0	2.7	0	0	0	0	5.4	0	
21-10-2024	0	14.6	0	2	0	0	0	0.7	0.6	0	0	0	0	1	31.6	19	7.2	0	0	4.9	15.3	6.8	3.6	
Sum	4.0	139.7	0.0	19.9	0.0	0.0	0.0	0.7	1.6	0.0	0.0	45.6	2.0	101.5	121.0	50.0	87.1	0.0	76.3	13.9	45.2	78.5	16.9	

Annex C: Performance of the weekly flood forecasting

“Accuracy” here refers to the state where data recorded in the MRC’s Mekong River Flood Forecasting System are cleaned and verified.

The adjustment of flood forecasting outcomes from the flood forecasting system requires flood forecasters to have extensive knowledge in hydrology and statistical modelling for estimating the relationships between stations upstream and downstream in the Mekong River Basin. Flood forecasting performance presented in the graph below shows the average flood forecasting accuracy at each key station along the Mekong mainstream from 15 to 21 October 2024.



The forecasting values from 15 to 21 October 2024 show that the overall accuracy is fair for a four-day to five-day forecast in lead time (less than 250 cm) for all forecasting stations.

Note: The higher percentage of flood forecasting accuracy is due to several key factors as follows:

- Missing rainfall in Cambodia (DOM) data and data input are not sufficient to be used for inputting into the flood forecasting model system.
- Chiang Saen station is influencing by hydropower upstream operation from China.
- Luang Prabang to Chiang Khan and Paksane to Stung Treng to Kratie have been influenced by hydropower operations upstream, tributaries inflows.
- The influence of heavy rainfall caused by storms and hydropower operations from upstream, tributaries inflows and the lower part of the Mekong floodplain, including the 3S (Stung Treng and Kratie).
- Fluctuations of the water levels at Tan Chau and Chau Doc stations were due to daily tidal effects of the sea in the Mekong Delta.
- Satellite rainfall data were not representative of the actual rainfall at ground stations in some areas of the Mekong region.



Mekong River Commission Secretariat

P. O. Box 6101, 184 Fa Ngoum Road, Unit 18 Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR
Tel: +856 21 263 263. Fax: +856 21 263 264 www.mrcmekong.org
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